

Evaluating the protective properties of plant extracts by analyzing the *in-situ* initial biofilm

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Dental erosion is the loss of tooth structure caused by acidic impact. Its prevalence is still increasing. The initial biofilm - resulting from the selective adsorption of salivary proteins to the enamel - plays a big role to protect the tooth. Plant extracts as rinsing solutions are a possible approach to improve protective properties of the biofilm.

Changes of biofilm proteome after rinsing with different plant extracts were analyzed quantitatively and qualitatively by mass spectrometry (nano-LC-MS/MS). Also, to investigate the influence of these plant extracts on the protective property of the biofilm against erosive mineral loss and their action as an ion reservoir inside the modified biofilm, ultrastructure and acid resistance of the biofilm were evaluated by transmission electron microscopy (TEM). The release of calcium- and phosphate ions was measured photometrically.

Different protein distribution patterns with more than 250 proteins were identified. Under the influence of the tested plant extracts, a lower amount of protein species could be identified compared to the control. In contrast, the biofilm density was increased and the modified initial biofilm was of higher tenacity than the control in an acidic milieu. Calcium- and phosphate measurements showed higher levels of ions release suggesting the biofilm treated with plant extracts as a potential ion reservoir.